MS58-3820D9M4
MoreSense 5.8G Radar Sensor Module
User Manual V1.0

Revision History

| Revision	Description	Release Date
V1.0	MS58-3820D9M4 Data Sheet Initial Version	2023-3-22

Catalog

1 Product Description

MS58-3820D9M4 is a miniaturized 5.8G radar sensor module launched by MoreSense.This module uses high-performance radar sensors combined with miniaturized planar antennas to achieve a size of 30 x 20mm while ensuring the performance of the sensor.

The sensor can detect that if there have the moving objects in the region by frequent difference between the transmit and receive signals (Doppler Principle)or high-frequency electromagnetic waves.

The sensor is not affected by ambient temperature,humidity,airflow,dust,noise,brightness and so on.With a built - in multi - filter algorithm,the module has a strong anti-jamming capability and its signal can penetrate glass, acrylic and other non-metallic materials.The sensor can be used to detect various scenes of human being or moving target sensing,including smart home,IOT,intelligent security surveillance and so on.Especially in the field of intelligent lighting,it has widely used in standard lighting products such as induction LED bulbs and T8 tubes lamps.

The module integrated with DIP switch for adjusting parameter such as sensing distance,delay time.
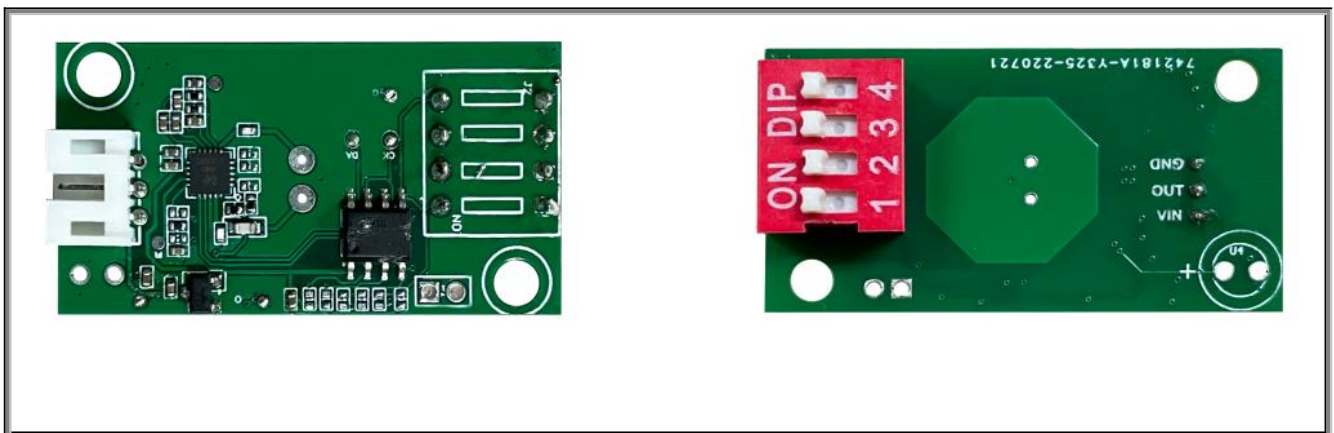
2 Product Features

a.Working Frequency Band:5.8G ISM Frequency Band;

b.Microwave sensor based on Doppler effect;

c.Sensing distance and delay time can be adjusted flexibly according to different application;

d.Using mature CMOS technology to achieve fully integration of ultra-cost-effective;

e.The chip has a built-in LDO that supports wide-voltage power supply;

f.SoC signal processor,which can directly output sensing control signals from a single chip;

g.Ultra low-power consumption,the overall current is less than 9 mA, and can be used for resistance-capacitance step-down power supply;

h.Support standard IIC interface,can be interconnected with other main control or sensors;

3 Key Application

• Smart Home:Wall Switch; Refrigerator...
• Induction of Moving Targets:Smart Door Locks; Smart Doorbells...
• Intelligent Lighting:Corridor Lights; Mirror Lights; Disinfection Lights;
    Miner's Lamps...
• Security and Smart Surveillance:Cameras...
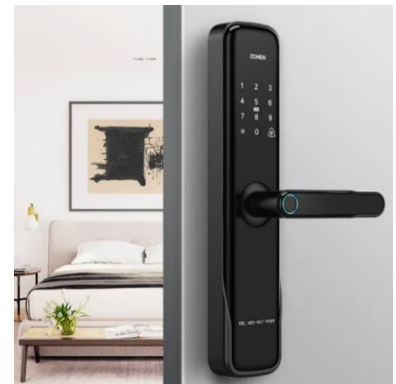
4 Parameter

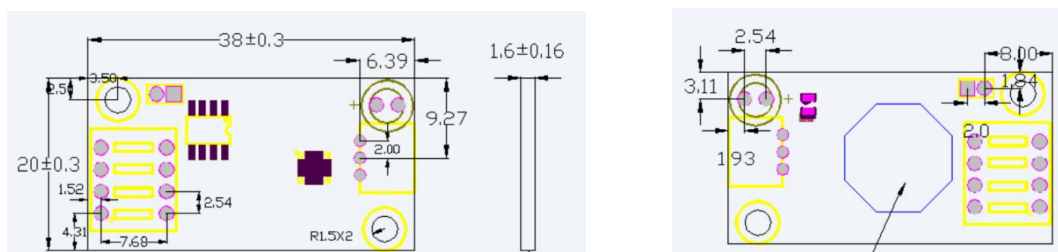| Type	Parameter	Value
RF Parameter	Frequency Range	5.725GHz-5.875GHz
	Transmit Power	-4dBm
	Antenna	Built-in;Flat Antenna
Hardware Parameter	Data Interface	GPIO
	Operating Voltage	5-12V
	Operating Current	9MA(Typical Value)
	Operating Temperature	-30℃- 85℃
	Storage Temperature	-40℃- 125℃
	Humidity	<85%
	Dimension	38mm x 20mm
Default Parameter	Power-On Self-Test Time	2s
	Sensing Output Level	3.3V
	Silent Output Level	0V
	Sensing Output Time	2s
	Inducting Distance	About 6m
	Customizing the Largest Sensing Distance	13m
	Max. Induction Radius with Hanging Height 3m	4m
	Setting Parameter Method	DIP Switch

5 Pin Definition
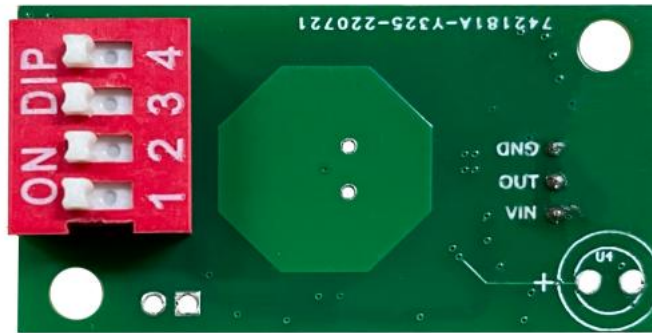
Table.1 MS58-3820D9M4 Pin Function Definition

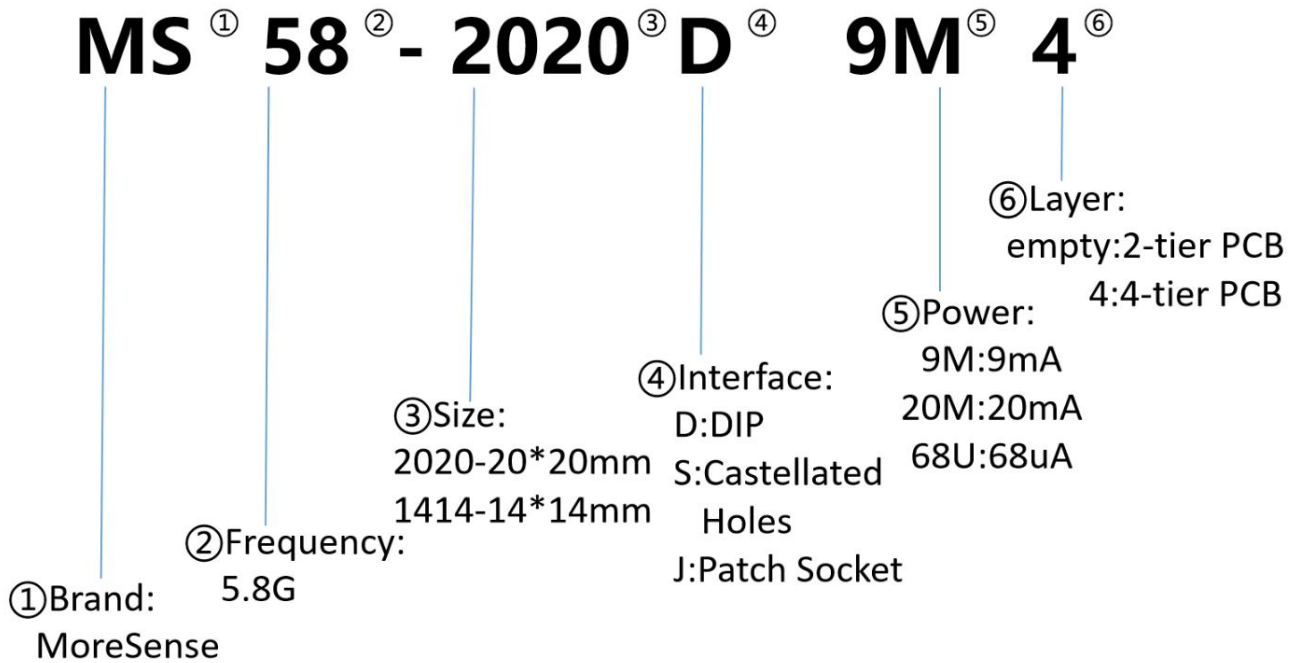| Pin	Name	Type	Discription
1	GND		Ground
2	OUT	O	Sensing Signal Output
3	VIN	I	Power Supply

I:Input   O:Out

6 Module Dimension

Unit: mm

7 Name Rules

MS①** 58**②**- 2020**③**D**④** 9M**⑤** 4**⑥

⑥Layer:
empty:2-tier PCB
4:4-tier PCB

⑤Power:
9M:9mA
20M:20mA
68U:68uA

④Interface:
D:DIP
S:Castellated
Holes
J:Patch Socket

③Size:
2020-20*20mm
1414-14*14mm

②Frequency:
5.8G

①Brand:
MoreSense

④Interface

D   **J**   **S**
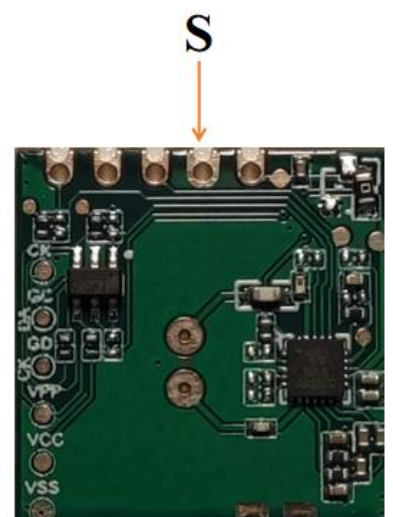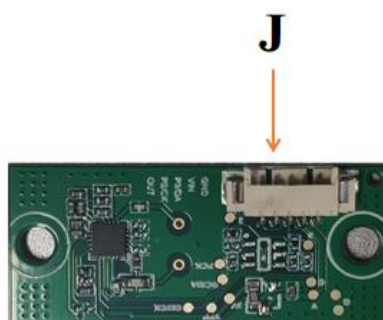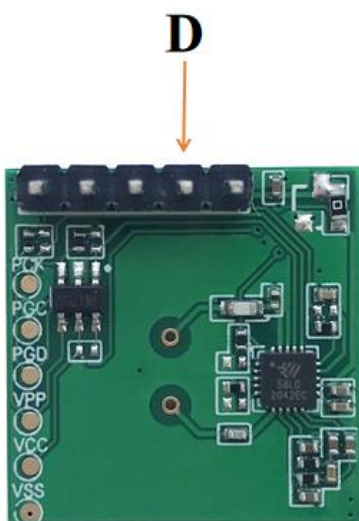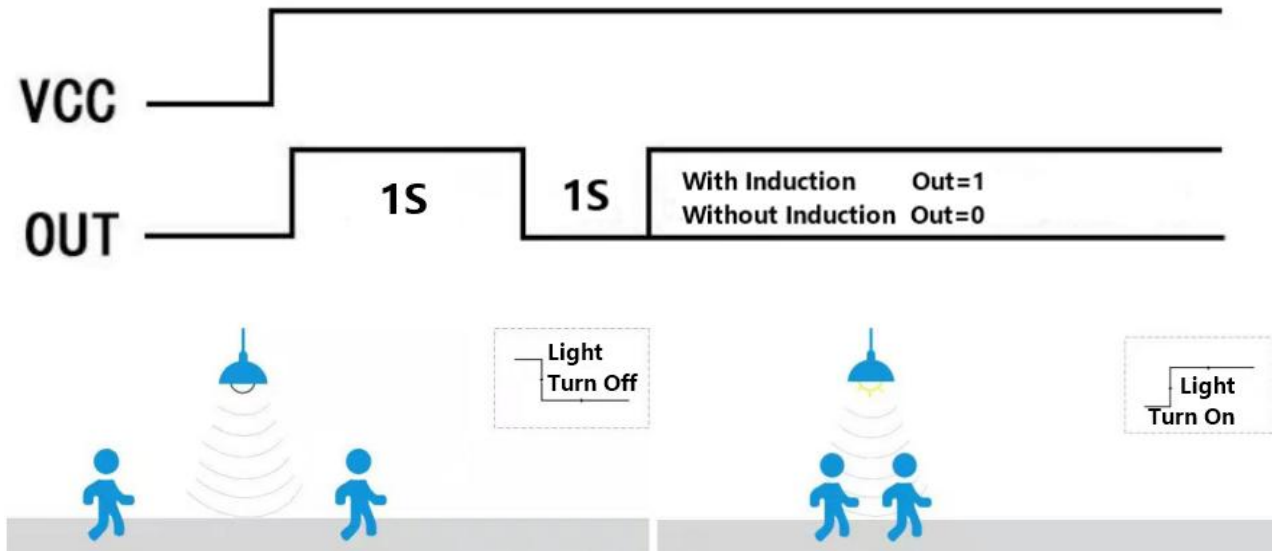
8 Operation Guideline

8.1 Module OUT RAM Timings

8.2 Induction Range

The sensing angle is about 120 degree.The actual sensing distance can be adjusted according to the needs.The above is the schematic diagram of radar detection range in case of high hanging.If the sensitivity is set higher, the detection range will be correspondingly larger.In the figure, the dark area is the high sensitivity area that the object can be fully detected,while the light area is the low sensitivity area that the object can be detected basically.The actual product structure and assembling environment also affect the distance and angle of radar detection.
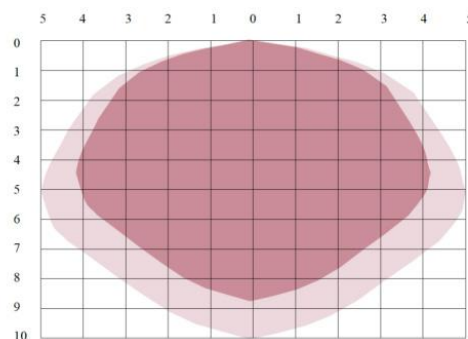
9 Precautions

⚠️ Precautions

| Try to avoid placing the radar antenna in the direction of large metal equipment or pipes,etc. |
|---|
| The front of the antenna should be installed without a metal shell or components to avoid shielding the signal. |
| The power frequency will interfere with the radar signals.During installation,it should avoid forwarding the AC drive power supply,staying away from AC power lines,rectifier bridges and other lines. |
| Covers such as glass,acrylic,or plastic are allowed,but there should be a proper clearance area in front of the antenna,and a minimum spacing of 5mm or more is recommended. |
| During installing multiple radar modules,please try to ensure that the antennas of each radar module are parallel to each other,avoiding positive irradiation between the antennas,and to maintain more than 1 m of space between the modules. |

10 Customization

Power Supply Voltage	Sensing Out Method	Setting Parameter	Supplement
☐ 3.3V	☐ IO Out (Reverse Supported)	☐ IO Setting Para.	☐ Light Sensor
☐ 5V	☐ UART	☐ UART	☐ Power Management Function
☐ 12V	☐ PWM	☐ IIC	—
☐ 24V	—	—	—

☐：Supporting　☑：Supported

11 Hardware Typical Application
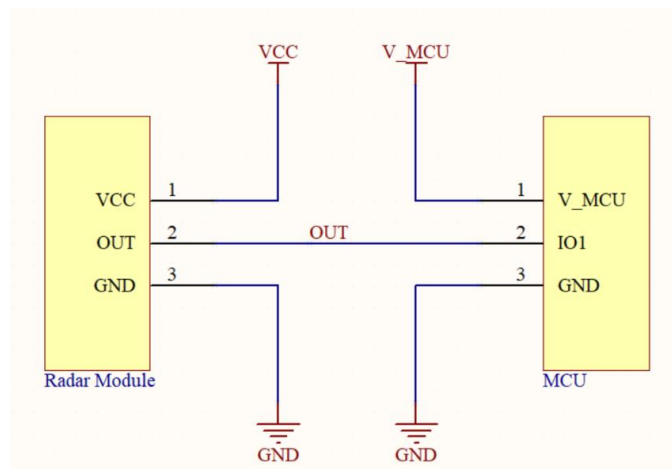
12 Package Information

12.1 Recommended Reflow Soldering Profile
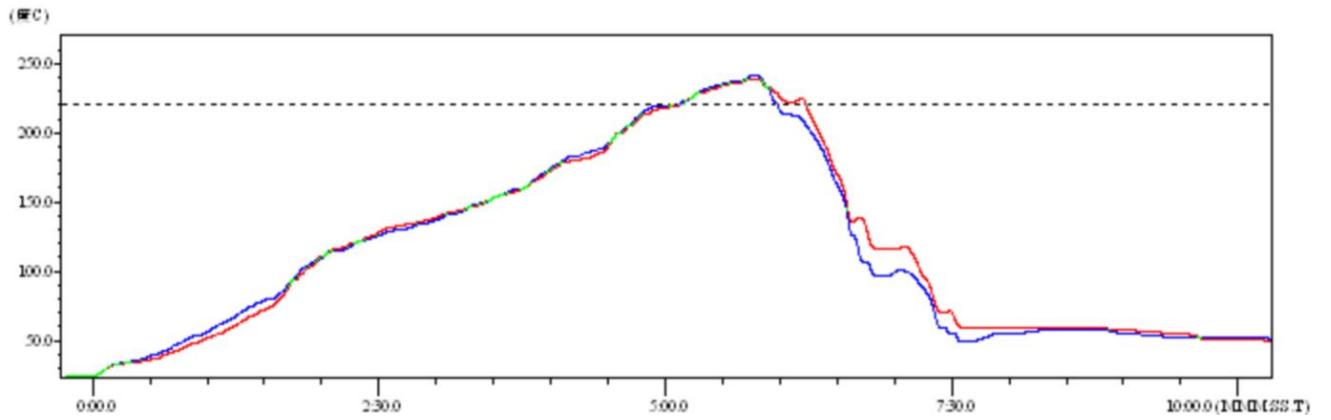
Figure 1.Thermal Reflow Profile

Table 1.Reflow Data

No.	Program	Temp. (℃)	Time(S)
1	Refluxing Time	Above 220℃	35~55S
2	Peak Temp.	Highest 260℃	

Note：:

1.It is recommended to use a nitrogen reflux furnace;
2.The oxygen content is less than 300ppm.

12.2 Instruction

A. Sealed storage period:12 months in an environment with a temperature of less than 30°C and a relative humidity of less than 60%.

B.Be re-baked before using if the window time exceeds 168 hours   after unpacking.

C. Recommended to use nitrogen filling method for baking.

D. Recommended to use nitrogen filling method.

E, Baking and rework requirements for this model:125±5°C, 24 hours.

F. Recommended storage conditions ≦10%,relative humidity under vacuum packaging.

G.If the SMT process requires to pass twice reflow ovens:

① TOP Surface② BOT Surface

Situation 1:The radar module is designed on the TOP surface of the customer's PCB.The the TOP surface needs to be baked when the TOP surface has not been produced after the BOT surface has been finished 168 hours (window time).

Situation 2;The radar module is designed on the BOT side of the customer's PCB and follows the normal baking rules.

Note:The window time means 168 hours from the end of the last baking to the beginning of the next reflow.

12.3 Package Method

Blister Packaging(Insulation)